

TREATMENT OF MELASMA WITH MICRODERMABRASION AND COMBINATION OF TOPICAL SKIN CARE REGIMEN 22% ASCORBIC ACID (AA), 19% GLYCERIN (G) AND 5% BORAGE VEGETABLE OIL (BVO)

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ABSTRACT

Objectives: To evaluate the safety and efficacy of combination of topical skin care regimen 22% ascorbic acid (AA), 19% glycerin (G) and 5% borage vegetable oil (BVO) and microdermabrasion in the treatment of refractory melasma **Design:** An open-label uncontrolled trail **Setting:** Department of General Surgery Jinnah Hospital Karachi **Period:** From December 2014 to May 2015. **Methods:** Total 18 female patients were selected using convenience sampling technique who fulfilled the inclusion criteria were selected. Melasma type was identified with the help of wood's lamp. All participants underwent microdermabrasion twice monthly for three months with combined treatment of skin care regimen. Monthly follow up assessment was done during treatment. **Results:** This painless combined treatment was successful in all participants. Most of the patients results in fifty percent of clearance in first month of therapy. Two patients noted mild exacerbation of melasma with sun exposure however; this was resolved with topical skin care regimen. Due to dramatic improvement of melasma, an excellent compliance was observed in patients. **Conclusion:** in Asian population combined treatment of microdermabrasion with topical regimen were found safe and effective in refractory melasma.

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INTRODUCTION

Melasma is symmetrical facial hypermelanosis which is common in exposed area of the body; it is an acquired disorder of skin. It is mostly seen in people with darker skin tone.¹ Melasma influences more in Asian population frequently as compared to white population. It has seen that women are affected more than men most frequently in ages of 20 and 40 years and those on oral contraceptive.² Melasmas are more often called as the "mask of pregnancy"², whereas it mostly occur in pregnant women in United States.³ The prevalence of melasma in Pakistan is shown as 46.4%.⁴ Melasma has effects on the social well

being of the patient.⁵ Melasma is idiopathic in origin however, pregnancy, hormone therapy, oral contraceptive pill, photosensitizing medications, cosmetics, family history, and thyroid dysfunction or mild ovarian disorder are the most reported and profound predisposing factors. One of the imperative predictor is Ultraviolet radiation, which can triggers melanocytes to generate melanin production, and in fact a little exposure of ultraviolet radiation can deteriorate melasma.⁶

Inflammation may present with hyper pigmentation which further worsens melasma.⁷ The surplus pigmentation can be appreciated in

the epidermis and dermis by exploit of a Wood's lamp (340–400 nm), whereas epidermal pigmentation can be appreciated with Wood's light (340–400 nm) testing; however, pigmentation of dermis is not accentuated with Wood's Lamp testing.⁷ Dermal melasma may have blue black appearance and undertones.⁷ It has been seen that in dark brown or black skin, Wood's light illumination does not restrict the pigment, and these patients are confidential as "indeterminate".⁸ Histologically, higher pigment is observed in epidermal and dermal layers of skin. Furthermore, the melanocytes appear large and more dendritic which are metabolically more active however the count of melanocytes is normal.⁹ The melanophages are macrophages found abundant in epidermis and dermis with high concentration of melanin. Small blood vessels are dilated and melanophages usually surround vessels with no inflammation. The melanin production may be affected by agents such as kojic acid, ascorbic acid, hydroquinone, azelaic acid, or alpha arbutin.^{3,8,10}

The topical regimen and other tretinoin, hydroquinone, mild corticosteroid cream or chemical peeling can produce transient desired results which further worsen the outcome. However, early studies associated with laser treatment often used light sources and pigment-specific lasers at standard parameters. On some occasions high fluence may worsen the condition by resulting in hypopigmentation of the skin. Ablative carbon dioxide (CO₂) and erbium: YAG (Er:YAG) lasers are not usually performed in clinical setting due to painful procedure with morbidity, may require general anesthesia. It take at least 15 days of home care and possibility of side effects such as hypopigmentation, scar formation and infection.¹¹ The resurfacing through ablative lasers may worsen the melasma.¹² There is one more treatment option like microdermabrasion, which is a non-chemical, superficial skin resurfacing method. It has indebted its efficacy to the non-invasive and

safety of the procedure.¹³ The studies have highlighted the remuneration of multiple, once-a-week managements in recuperating hyperchromic discolorations,¹⁴ facial scarring¹³ and facial photodamage¹⁵ with microdermabrasion.

The method of action by which microdermabrasion restructures the skin appearance is not known. However, several studies have suggested that the clinical improvement is created through a dermal remodeling and wound healing repair.^{16,17} In spite of the not-known mechanism, the patients and operators both have recognized clinically the efficacy of this method.^{14,15} Previous studies have showed the limited access to the treatment of melasma and its types. This study has shown the combine effect of topical and microdermabrasion on refractory or mixed melasma. The objective of his study is to evaluate the safety and efficacy of microdermabrasion and combination of topical skin care regimen that are 22% ascorbic acid (AA), 19% glycerin (G) and 5% borage vegetable oil (BVO) in the treatment of refractory melasma.

METHODOLOGY

This study was conducted in the department of general surgery Jinnah Hospital Karachi. Total 18 female patients, who were having refractory melasma, and age more than 20 years and less than 30 years were included, melasma area severity index (MASI) score ranging from 21-30 and Fitzpatrick's skin type score IV and V were included. The exclusion criteria for our study, was set for the candidates who were pregnant, had any keloidal tendencies, photosensitive dermatoses or hypersensitivity or having retinoids or any other drugs known to cause facial hypermelanosis were excluded. A complete past and present medical history and full exposure examination was done. The Wood's lamp testing was used for identifying type of melasma. The Baseline Melasma Area Severity Index (MASI) scoring was done. The pre management was

made in regard to recommend the candidate to wash the affected area with soap and water before each session. Patients were prescribed to apply broad spectrum sun screen with SPF >30 and to avoid heat and sunlight exposure.

All participants underwent microdermabrasion twice monthly for three months with combined treatment of skin care regimen. Monthly follow up assessment was done during and after treatment. Efficacy was assessed for four weeks after the last session. Results were evaluated according to percentage reduction in MASI score. Patients were examined for any side effects. Digital photographs taken before the start of treatment and at the end of treatment were compared. The verbal consent was taken from the candidates and the objective of the study was explained prior to the study, the candidates were selected according to the inclusive criteria of the study. The result were analysed in SPSS 20.0 version.

RESULTS

Demographic details: In this study, 33.3 % of women were of between 20 to 22 years old, 16.7 % were 22 to 25, 30.3% 25 to 27 years and 19.7% were 27 to 28 years. The percentage of house wives were more in our study about 50%, whereas 27.8% were working and 22.2% were students. The duration of Melasma was less than 5 years accompany 50% of women, more than 5 years were 38.9%, less than 20 years 11.1%.

SKIN TEST

The Fitzpatrick's skin type has revealed that 55.6% of the candidates had type IV skin and 11.1% showed type V skin (Graph No. 1). The Wood's lamp test showed that 27.8% candidates were having epidermal melasma, 16.7% candidates were having dermal melasma and 55.6% showed mixed dermal/epidermal (refractory) melasma (Table No. 2). **Melisma Area Severity Index (MASI) Score** The mean MASI score of the candidates were 2.29, whereas majority of candidates (50%) in the MASI score range of 21-

30. However, in this study 5.6% candidates showed less than 50% reduction in MASI scoring (table 3).

Efficacy of Treatment

The efficacy of the treatment according to our study was established as excellent in 50% of the candidates, 22.2 % showed good result, 16.7% showed fair response with minimal risk. However, 2 patients (11.1%) showed mild exacerbation of melasma with sun exposure but satisfied with topical skin care regimen.

Table 1: Demographic Analysis

Age	
20 to 22	33.3%
22 to 25	16.7%
25 to 27	30.3%
27 to 30	19.7%
Occupation	
Housewife	50%
Job holder	27.8%
Student	22.2%
Duration of Melasma	
Less than 5 years	50.0%
More than 5 years	38.9%
Less than 20 years	11.1%
Smoking	
Never	38.9%
Sometimes	37.9%
Occasionally	11.0%
Daily	12.2%

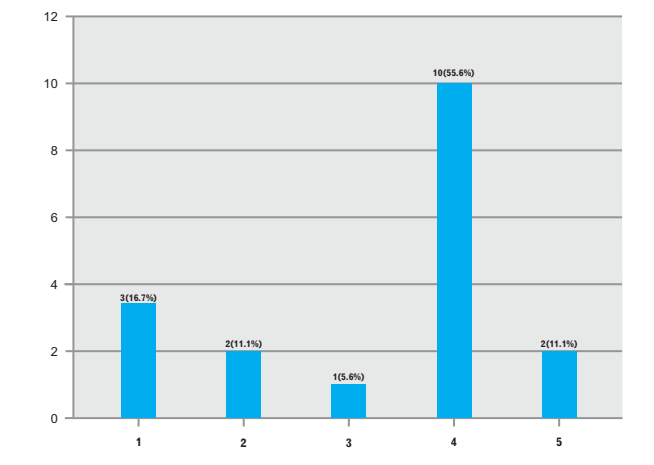


Figure No. 1: Fitzpatrick's skin type (n=18)

Table 2: Wood's Lamp Testing (n=18)

	Frequency	Percentage
Epidermal	5	27.8
Dermal	3	16.7
Mixed	10	55.6
Total	18	100.0

Table 2: Wood's Lamp Testing (n=18)

Percentage reduction in MASI score	Frequency	Percentage
10-20	3	16.7
21-30	9	50.0
31-40	3	16.7
41-50	1	5.6
>50	1	5.6
Mean SD		1.047
Mean		2.29

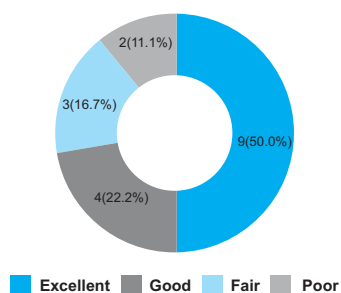


Figure No. 2: Treatment Efficacy (n=18)

DISCUSSION

The combination of microdermabrasion, tropical drug therapy with 22% ascorbic acid (AA), 19% glycerin (G) and 5% borage vegetable oil (BVO), and a skin care regimen like sun screen were used to decrease melanin synthesis which lead to significant results.

Finding from other studies showed different outcome for melasma. This was the first study in Pakistan in which the efficacy of the treatment has shown to have 50 % effects.

In contrast to this study, Kauvar ANB et al. in New York, used different combined therapy with Nd:Yag laser and microdermabrasion have given safe and non-invasive therapeutic measure for

treatment of melasma.¹² Moreover, Katz TM et al. also reported that Fractional Photothermolysis is a safe and effective treatment for refractory melasma, with long-term remission. He indicated no significant interest with commercial supporters.¹⁸

A recent study using the 1,927-nm thulium laser in Chinese patients showed a high incidence of post-inflammatory hyperpigmentation and rebound melasma.¹² When used to treat melasma, high-fluence lasers cause excessive thermal damage and inflammation plus subsequent increased pigmentation leading to rebound hyperpigmentation and melasma recurrence.

However, there are multiple studies done on Microdermabrasion (MD) for evaluation of its effects on melasma and the treatment criteria which has shown mild to moderate effect of MD on therapeutic effect of melasma.¹⁹ The efficacy of this combined treatment is may be because synergistic influence of microdermabrasion with topical skin care regimen. Microdermabrasion improves the penetration topical skin care regimen, which influence the clearing of the epidermal pigment and enhances epidermis formation.¹²

Melasma can be aggravated by unintentional sun exposure and irritation of the skin. However, the most convenient treatment regimen should be painless and should not affect quality of life and well persuade reduction of the condition. In Pakistan the predisposing factor of melasma include sun exposure, pregnancy and use of cosmetics which may affect the percentile and incidence of the disease and also affects the therapeutic efficacy.

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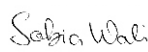


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AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
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2	Muhammad Suleman Pirzado	Supervision and Guidance in Results and Discussion write-up	
3	Nadia Hassan	Critical review of whole Manuscript and Data entry	
4	Sikander Munir Memon	Literature Review and Data Analysis	